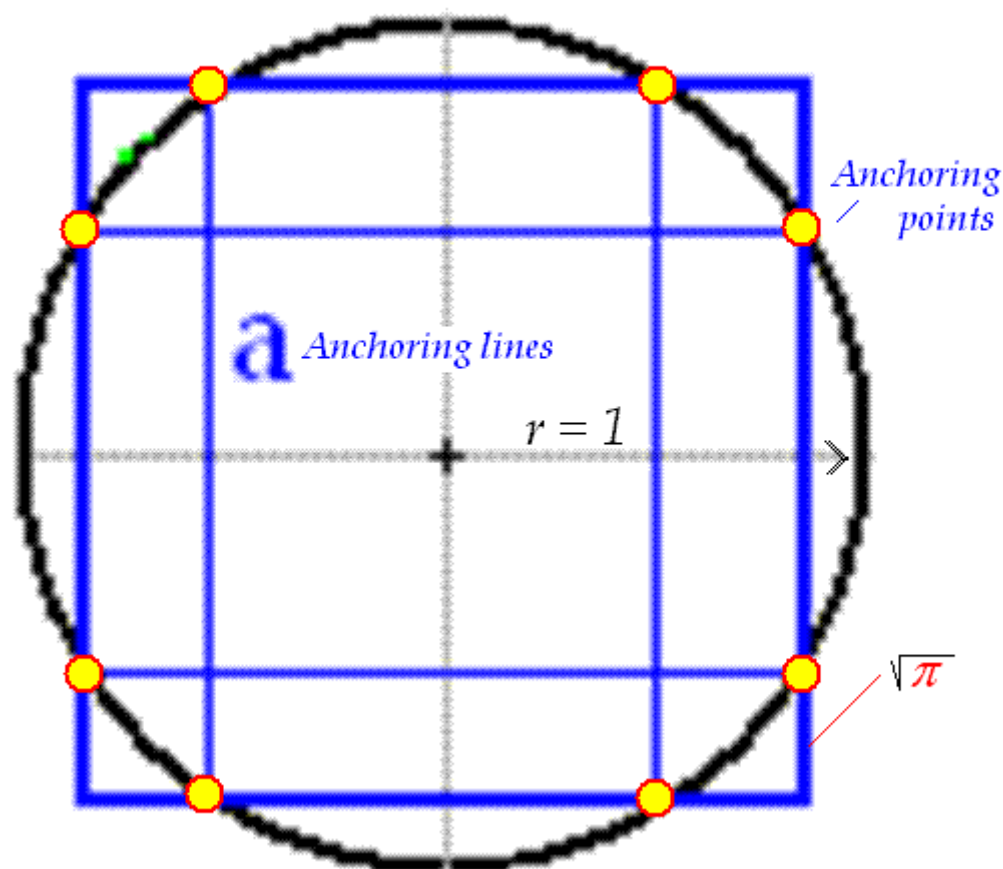


Squaring the Circle

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Drawing 1

Introduction

In the construction or squaring the circle I going to try of respect a lot the Grecian limitations, but of course, using some basic principles that I think are correct and necessary for this work, accepting as norm a logic deduction: "What it is not forbidden, logically it is allowed".

But much more, this method would be interesting apart of being respectful with ancient norms, for the use a different principle of construction, as it is the use of the "integer" circumference as the first parameter to take in mind. Later on with the circumference as initial parameter we obtain the other ones.

In this work it is used two unique tools as they are:

A ruler without scale, which represents the length of the circumference $2 \cdot \pi \cdot r$,

A compass

Of course, apart paper, pencil, etc. to draw the transformation.

The ruler will consist in a simple long piece of thin and flexible material

And here the interesting of this works begins:

We don't start using a unit of radius as can be 1, but using a unit of circumference 2π that will be the longitude of the flexible ruler.

That is, ruler = longitude of the circumference that we will use to get the circle that later on we proceed to transform into a square of equal area.

One of the Grecian premises to use the ruler, alone to mark and make straight lines with it, and so will be. But as it is also obligated, we don't use arithmetic or numeric adjustments, alone delineate line.

Other question, pointed before, is the characteristic of the ruler that must to be flexible.

All the material are more or less flexible, in such a way that if we want of bend the ruler till it gets the form a circumference, we get little circumferences is the material is more flexible, and bigger circumferences if the ruler material is less flexible.

In any case, the flexibility of the material will be that give the greater that the circumference is.

Now well, as this procedure is perfectly given in practice, also must to be given in theory.

For example, we can build a circumference of 10 cm. of diameter with a very flexible material, or we to obtain a circumference of 10 km long with a not flexible material, but always a circumference can be built. Nevertheless, we think in an ideal and very flexible material.

What be the main reason to use the ruler as length of the circumference?

Firstly to avoid the problem of being Pi a transcendental number. Here is the unit of circumference and nothing more. That is, it is treated as an integer parameter.

To have a hard parameter for our works, and of course, to be get a final good result.

It doesn't matter the length of the ruler L, because the radius to build will always be $L / 2\pi$

Development

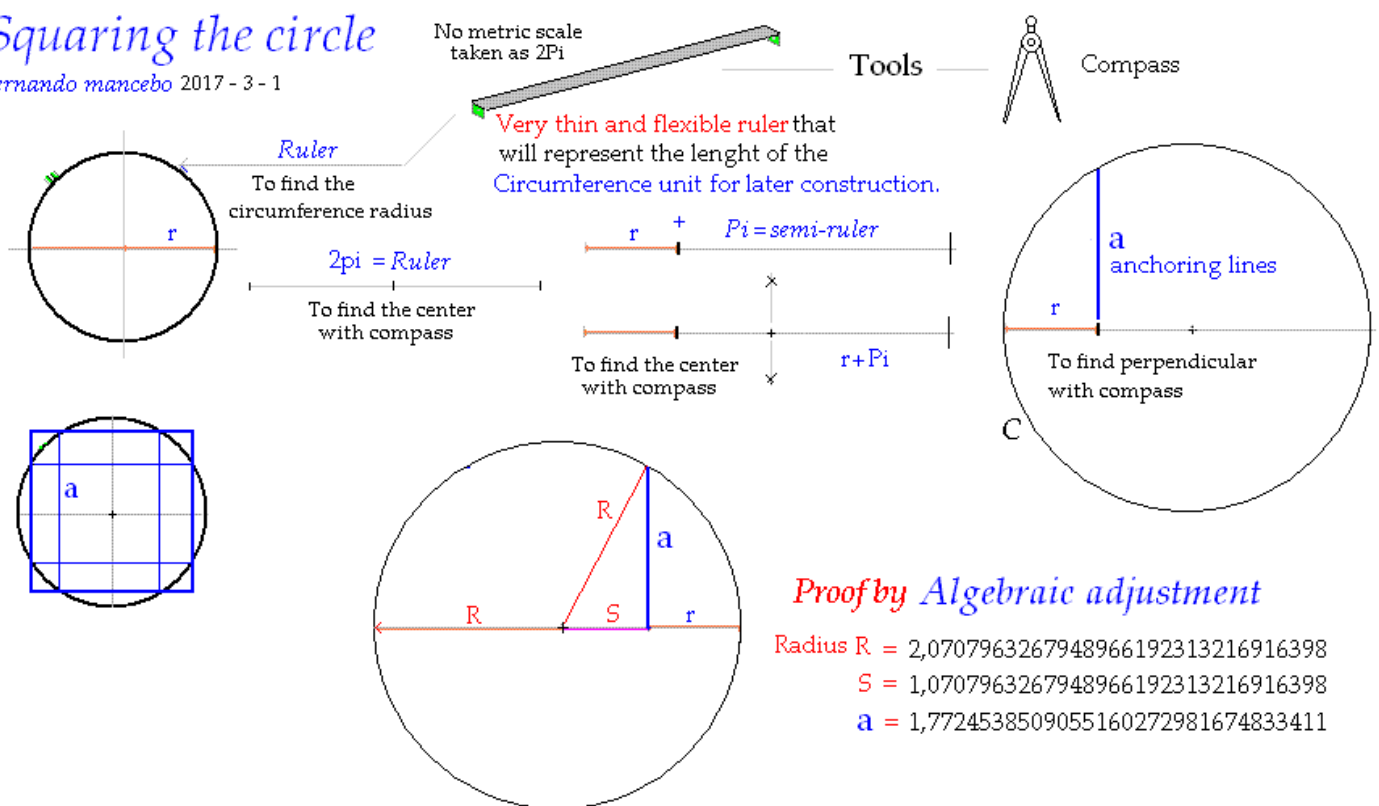
For beginning the transformation, we mark with the pencil a straight line in the paper. Then, we bend the ruler to form a complete y perfect circumference. (When the ruler is ideal, the circumference will be also ideal)

Later, set and center the circumference on the straight line of the paper, and mark the diameter of the circumference.

As final of this first stage, we use the compass to find the centre of the diameter, and so, to get the radius (r). Let's follow the drawing

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Drawing 2

Now, we must find the square root of π for later on draw the sides of the squaring square. For that, it will be necessary to encounter a bigger circumference where its diameter should be composed by the radius (r) of the anterior circumference, plus the number π , and this way, the new circumference has relation with the radius (r) as well as with the number π . Then, we add the length of π (semi-ruler) with (r), giving us the radius R of the bigger circumference. Later, we find the centre of this radius R for building the new bigger circumference C . Now, with use of compass, it is drawn a perpendicular from the mark of the radius (r) till cut the circumference C , getting with this the first anchoring line (a) that will be precisely the square root of π .

Finally, we pass this anchoring line (a) to the anterior circumference that must be squaring, choosing for our part any of the different manners that are possible. For example, find the centre of the anchoring line (a), and later on the cut the axes of the squaring circumference with the compass, or any other method.

Later on, we can proceed to the adjustment of all these parameters using algebra, trigonometry, etc. I think, our work is correct,
The time says us.

To end up, a question:

What is the worth and difference of this method?

Because of here the value of π is not used, but a piece of ruler of any dimension on which we apply the consideration of circumference unit and integer parameter.